

PATENT SPECIFICATION

611,794



Convention Date (United States of America): July 9, 1945.

Application Date (in United Kingdom): May 8, 1946. No. 13955/46.

Complete Specification Accepted: Nov. 3, 1948.

Index at acceptance :—Class 43, A(4:5c).

COMPLETE SPECIFICATION

Improvement in Adjustable Fastening Devices

We, PIONEER PARACHUTE COMPANY, Incorporated, a corporation organized under the laws of the State of Connecticut, United States of America, of Elm Street, Manchester, Connecticut, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

This invention relates to new and useful improvements in fastening devices, and more particularly, to adjustable fastening devices of the buckle, hook and ring type for use with belts, straps, webbing and the like.

The principal object of the present invention is to provide a novel fastening device of the stated type that may be readily adjusted lengthwise of an associated web or strap and is operable to automatically lock upon the web or strap in the position to which adjusted when said strap is placed under tension.

Another object of the invention is to provide a novel fastening device of the character described which is constructed and arranged so that the greater the tension or pull placed upon the associated web or strap, the tighter will be the clamping or gripping force exerted by the device upon the web or strap.

A further object of the invention is to provide novel fastening devices having the features and advantages described which are of relatively rugged, simplified construction, relatively inexpensive to manufacture and entirely efficient and reliable in use.

In accordance with our invention we provide a fastening device or buckle for use with objects such as belts, straps, webbing and the like, comprising a quadrilateral open frame having a friction gripping member mounted to slide within the frame open-

ing on the side portions of the frame, characterized by one end portion of the frame being substantially thicker than the sides and the other end portion thereby to provide an offset or projection with which the gripping member is designed to cooperate in gripping an object.

Our invention, and the various features and details of the construction and operation thereof, are hereinafter fully set forth and described with reference to the accompanying drawing, in which:

Fig. 1 is a view in perspective showing a buckle fastener embodying the present invention having associated therewith a suitable strap or belt;

Fig. 2 is a sectional view taken on line 2—2, Fig. 1, the strap or belt having been removed;

Fig. 3 is a sectional view taken on line 3—3, Fig. 2;

Fig. 4 is a view in perspective of a hook fastener embodying the present invention shown in conjunction with a suitable belt or strap and complementary ring assembly;

Fig. 5 is a view in perspective showing a ring construction embodying the present invention; and

Fig. 6 is a view in perspective of a modified form of buckle fastener embodying the present invention.

Referring now to the drawing, and more particularly to Figs. 1 and 2 thereof, reference numeral 1 generally designates a buckle type fastener made according to the present invention. The buckle 1 comprises an open, generally rectangular, or square, frame 2 having integral side and end portions 3 and 4, 5 and 6, respectively, which define or bound therewithin an opening or eye 7 likewise of rectangular or square shape. It is to be noted that the end portion 6 of the frame 2 is substantially thicker than the other end and side portions

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thereof, and that said end portion 6 is arranged to provide an offset or projecting portion at the underside of the buckle as indicated at 8.

5 Slidably mounted upon the side portions 3 and 4 of the frame 2 for movement within the eye 7 between the frame end portions 5 and 6, is a friction grip member generally designated as 9. As shown, the face or
10 surface 10 of the friction member 9 is substantially flat and parallel to the inner surface of the adjacent frame end wall portion 6, and may be knurled or otherwise provided with roughened surface for better
15 frictional engagement with an associated strap or belt as hereinafter described. From the upper edge of the flat surface portion 10 the configuration of the friction member 9 is such that the surface curves inwardly
20 and then downwardly, as indicated at 11, and then declines forwardly in a substantially flat surface portion 12 to meet a substantially flat bottom or lower surface 13, the corner edges of the latter being rounded
25 into the flat surface portions 10 and 12 as shown.

To facilitate mounting of the friction member 9 upon the frame 2, the said member 9, for example, may be fabricated in a
30 single piece with its end portions suitably contoured so that when the frame is free of all webs or straps and the member is positioned diagonally of the frame, the ends of the member may clear the frame to there-
35 by completely disengage said member therefrom; or may be fabricated in two parts constructed and arranged as shown in Fig. 3, and suitably secured together, for example, by means of rivets 14. It is to be
40 noted that the friction member 9 projects above the plane of the upper surface of the frame 2, and also projects below the lower surface thereof substantially to the level of, or coplanar with, the under surface of the
45 offset or projection 8 of the frame end portion 6. Cut-out portions or recesses 15 and 16 are provided in the ends of the friction member 9 to slidably receive the frame side portions 3 and 4, and the recesses 15 and
50 16 are made slightly larger than said frame side portions to permit of limited rocking movement of said friction member 9 relative to the frame 2.

The buckle 1, constructed as herein described, may be employed effectively to
55 securely connect or fasten together either the opposite ends of the same strap or belt, or the adjacent ends of two straps or belts, as the case may be. This may be accomplished by permanently securing one strap
60 end 17 to the buckle 1 about the end portion

5 thereof, for example, by passing the said strap end about the frame end portion 5, and then stitching or otherwise securing the free end to the strap proper as indicated at 18. The other strap end portion 19 is ad-
65 justably connected to said buckle by passing the same beneath the frame 2 upwardly through the eye 7 thereof and between the end portion 5 and friction member 9, then
70 over the latter and reversely through the said eye 7 between the friction member 9 and the frame end portion 6, then outwardly beneath the latter with the free end 20 thereof disposed in the relation shown in Fig. 1
75 of the drawing. If desired, the end of said strap portion 20 may be folded upon itself once or twice and stitched as indicated to provide a stop 21 to prevent complete dis-
80 engagement of the strap end portion from the buckle 1.

With the buckle 1 and associated strap end portions arranged as shown and described, slack in the strap or straps may be taken up and the strap or straps tightened to the desired degree merely by grasping
85 the free end 20 of the strap portion 19 and pulling the same through the buckle 1. As the strap or straps are placed under tension, the friction member 9 is caused to clamp or grip the strap between itself and the frame
90 end portion 6, with increasing pressure, and the offset 8 of the latter is caused to bite increasingly into the strap with the result that it is securely and tightly held in the position to which tightened or tensioned. In
95 other words, the greater the tension placed upon the straps or strap by pulling upon the free end 20 thereof, the tighter will be the clamping or gripping action of the buckle upon the strap, and the construction
100 and arrangement of the buckle is such that, once tensioned to the desired degree, the straps will not work loose until released.

The buckle may be released and the strap or straps loosened when desired or required
105 merely by a person engaging his fingers under the end portion 6 of the frame 2 and actuating or rocking the latter in the direction indicated by the arrow in Fig. 1 to thereby release the bite and gripping force
110 of the offset 8 and friction member 9, respectively, upon the strap. Loosened in this manner, the strap or straps may again be readily and easily retightened to the desired tension merely by pulling upon the free end
115 20 of the strap 19 to cause the buckle to grip and hold the same in the manner previously described.

In lieu of the buckle 1, and referring to Fig. 4 of the drawing, the invention may be embodied in a hook type fastener 22 for

connection, for example, to a ring fitting 23 having permanently secured thereon an end of a strap or belt 24. Such a hook fastener, may comprise a suitable hook construction 25 having at its base a generally rectangular or square frame 26 including side and end frame portions 27 and 28, and 29 and 30, respectively, which define or bound therewith a generally rectangular or square eye or opening 31. It is to be noted that the end portion 30 of the frame 26 is constructed as hereinbefore described to provide an offset or projection 32 at the underside thereof as in the case of the buckle 1, and that likewise there is slidably mounted upon the side frame portions 27 and 28 of said frame 26, a friction member 33 which is constructed and arranged as shown and previously described herein.

As shown in Fig. 4, the end portion 34, either of the strap 24, or of another strap, is adjustably connected to the hook fastener 22 in the same manner and relation as described in connection with the buckle 1 shown in Fig. 1 of the drawing, the said strap portion 34 being passed beneath the frame 26 and upwardly through the eye 31 between the frame end portion 29 and the friction member 33, over the latter and reversely through the eye 31 between member 33 and the frame end portion 30, then outwardly beneath the latter with the free end 35 thereof disposed in the relation shown.

Instead of providing the hook fastener with adjustable belt or strap fastening means as described, the construction of the present invention may be embodied in a ring assembly for connection with a suitable hook or other form of fastener of conventional type. Thus, and referring to Fig. 5 of the drawing, there may be provided a ring structure designated generally as 36 comprising a loop portion 37 and a frame portion 38 including integral side and end portions 39 and 40, and 41 and 42, respectively, which define or bound therewithin a generally rectangular or square opening or eye 43. As in the case of the buckle 1 and the hook fastener 25, the end portion 42 of the frame 38 is constructed to provide an offset or projection 44 at the underside thereof as indicated, and there is slidably mounted upon the side frame portions 39 and 40, a friction member 45 identical in construction to the friction member 9 previously described herein. In this instance, as in each of the foregoing, the end portion of a strap or belt 46 is passed beneath the frame 38 and upwardly through the eye 43 between the frame end portion 41 and the friction member 45, over the

latter and reversely through the eye 41 between the friction member 45 and the frame end portion 42, then outwardly beneath the latter, with the free end 47 thereof disposed in the relation shown.

In Fig. 6 of the drawing, there is illustrated a modified form of the buckle of Fig. 1, which comprises a frame 48 including side and end portions 49 and 50, 51 and 52, respectively, and having a cross-bar portion 53 spaced intermediate the end portions thereof to sub-divide the frame into a pair of adjacent openings or eyes 54 and 55, respectively. This modified form of buckle, as in the case of the buckle 1, is provided with a friction member 56 that is slidably mounted upon the frame side portions 49 and 50 for movement within the eye 55 in parallel relation to the frame end portion 52, the latter being provided with an offset or projecting portion 57 as previously described herein. Furthermore, if required or desired, the buckle shown in Fig. 6 also be provided with a second friction member 58 (shown in dotted lines), slidably mounted upon the frame side portions 49 and 50 for movement within the eye 54 in parallel relation to the frame end portion 51, the latter in such event being provided with an offset or projecting portion 59 as shown in dotted lines.

Fastening devices constructed as herein illustrated and described, may be used advantageously in most cases where it is desired to provide adjustable fasteners for belts, straps, webbing and the like, such as, for example, in parachute harnesses, luggage straps, ship stays and braces, apparel belts, suspenders and shoulder straps, and many other instances too numerous to mention herein.

From the foregoing, it will be apparent that the present invention provides a novel fastening device that may be readily adjusted lengthwise of an associated web or strap and which is operable automatically to lock upon the web or strap in the position to which adjusted when said strap is placed under tension. The invention also provides a novel fastening device of the character described which is constructed and arranged so that the greater the tension or pull placed upon the associated web or strap, the tighter will be the clamping or gripping force exerted by the device upon the web or strap. Furthermore, the invention provides a fastening device, having the features and advantages described, which is of rugged, relatively simplified, construction, relatively inexpensive to manufacture and entirely efficient and reliable in use.

While certain embodiments of the invention are illustrated and described herein, it is not intended that the present invention be limited to such disclosures, and changes and modifications may be made therein and thereto within the scope of the claims.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed we declare that what we claim is:

1. A fastening device or buckle for use with objects such as belts, straps, webbing and the like, comprising a quadrilateral open frame having a friction gripping member mounted to slide within the frame opening on the side portions of the frame, characterized by one end portion of the frame being substantially thicker than the sides and the other end portion thereby to provide an offset or projection with which the gripping member is designed to cooperate in gripping an object.
2. A fastening device or buckle according to claim 1, characterized by the surface portion of the gripping member which cooperates with the thicker end portion of the frame being substantially flat and parallel to the inner face of the thickened end wall.
3. A fastening device or buckle according to claim 2, characterized by the flat surface of the gripping member being knurled or roughened.
4. A fastening device or buckle according to any of claims 1 to 3, characterized

by the exterior of the gripping member curving inwardly and downwardly from the upper edge of the flat gripping surface, then declining forwardly in a substantially flat surface portion to meet a substantially flat bottom or lower surface the corner edges of which are rounded into the substantially flat surface portion and the lower edge of the flat gripping surface.

5. A fastening device or buckle according to any of claims 1 to 4, characterized by the gripping member being relatively loosely mounted upon the frame side portions to provide for limited rocking movement of the gripping member about its axis parallel to the thickened end portion of the frame.

6. A fastening device or buckle according to claim 5, characterized by the opposite ends of the gripping member having recesses to receive the sides of the frame, said recesses being slightly larger than the frame sides to permit the gripping member to have the limited rocking motion in relation to the frame.

7. A fastening device or buckle, substantially as set forth and as illustrated in the accompanying drawing.

Dated this 8th Day of May, 1946.

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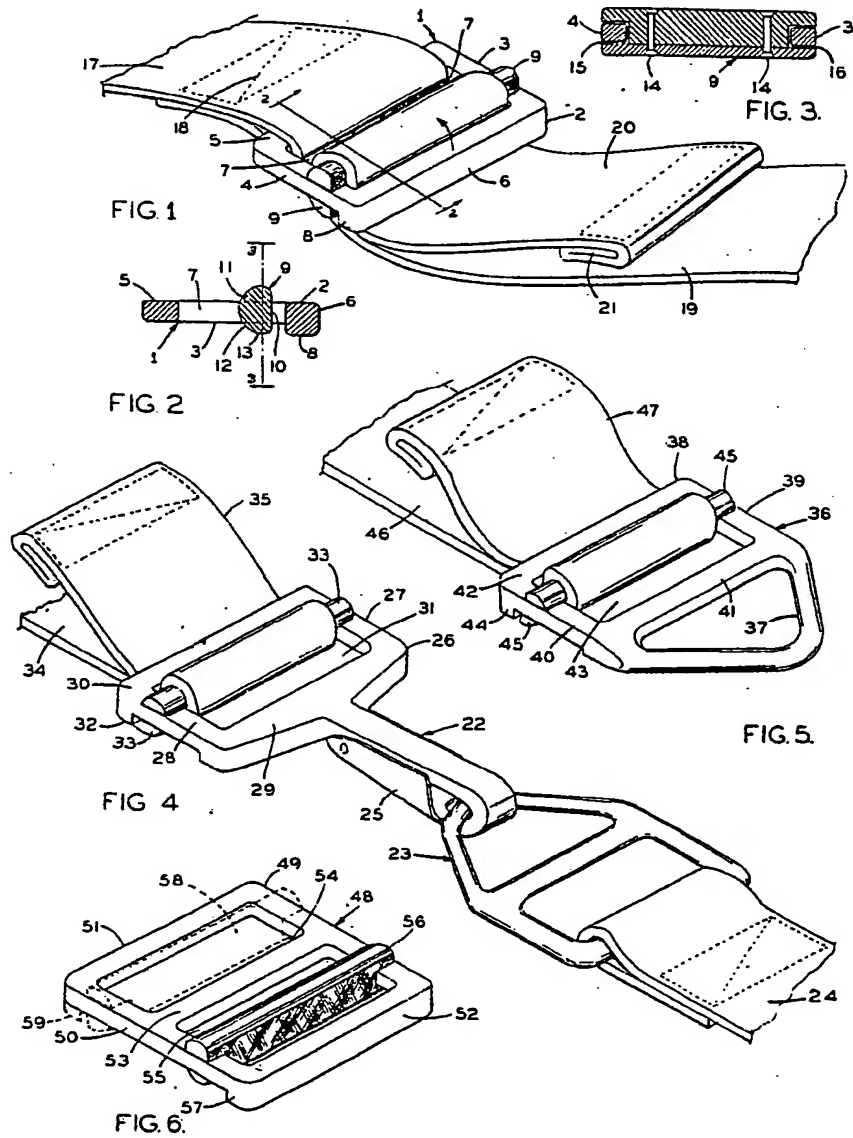
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COMPLETE SPECIFICATION

1 SHEET

[This Drawing is a reproduction of the Original on a reduced scale.]



H.M.S.O. (Ty. R.)